

SHEEP INVESTIGATIONS - 1947-48

The Relationship of Physical Balance To Energy Value
and Tissue Formation In Sheep

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Several years of physical balance studies with sheep rations have been completed. During the course of these years, more than 2,500 lambs have been used in the experiments. A wide variety of feeds have been employed in these tests also. The feeds composing the experimental rations have varied widely in nutritive value and palatability. In spite of this fact, the results of these experiments have been in agreement with remarkable consistency. While many levels of physical balance have been studied, recent trials have been limited to proportions of concentrates to roughage ranging from extremes of 35 percent to 65 percent up to 55 percent to 45 percent. Paper pulp and ground wood pulp have been fed as the only source of bulk in the rations in an effort to vary the physical properties without affecting seriously the nutritive value of the ration. Finally, in a move to accomplish this and to obtain more accurate control the experimental rations were adjusted on the basis of ratio of crude fiber to total digestible nutrients. It is felt that this constitutes as good an expression of concentration and bulkiness as any method, and would result in a comparable basis of physical properties between rations even though they varied widely in the kind and nature of feeds composing them.

Even though the gains of lambs have consistently been in favor of those receiving rations midway between wide extremes of concentration and bulkiness, and the efficiency of feed utilization as measured by the gains made per unit of digestible nutrients consumed has also favored this group, little information has been obtained regarding the degree of finish of the lambs fed at different levels. It may be that an optimum physical balance favors more rumination, greater micro-organic activity in the rumen and other factors causing greater efficiency of feed use. There is a limited amount of evidence from experiments completed that the lambs fed the more highly concentrated rations had more finish. It was to check this point that the present experiment was begun.

Two lots of lambs, each divided into three series, are being fed in this year's tests. Lot 1 is being fed corn and alfalfa hay, the three series each receiving these feeds so that the ratios of crude fiber to total digestible nutrients are approximately 1 to 3, 1 to 4, and 1 to 5 respectively. Lot 2 also is divided into three series which receive oat groats (instead of corn) and alfalfa hay with the ratios of fiber to digestible nutrients corresponding to those of the three series of lot 1.

The plan of the experiment calls for the slaughter of most or all of the lambs so a detailed study of tissue formation can be made. The carcass grades will be studied by the usual methods and in addition a sample, probably from the rib, will be taken to determine whether the carcass grades are consistently correlated with degree of finish and of tissue growth. Some complete body analyses may be made in an effort to determine specifically what is the cause of greater gains in body weight if these gains in weight are not fat formation.